

IN THE ABSTRACT:

~~For the purpose of providing a magnetic resonance imaging apparatus for capturing water/fat-separated images free of banding artifacts in an SSFP state, an apparatus comprises:~~  
An apparatus includes acquiring means (202) for acquiring echo data of a plurality of views in which a phase difference between water and fat is  $2\pi/m$  with spins within a subject brought to the SSFP state and repeating the acquisition for  $k = 0$  through  $M - 1$  with a step difference in a phase of an RF pulse of  $2\pi \cdot k / M$ ; transforming means (204) for conducting Fourier transformation on the echo data based on the phase step difference; separating means (206) for separating water data and fat data respectively in  $F(0)$  term and  $F(1)$  term of the Fourier-transformed data using the phase difference between water and fat; adding means (208) for obtaining a sum of absolute values of at least the water data or fat data in the  $F(0)$  term and  $F(1)$  term; and image producing means (210) for producing an image based on the sum data.